ISSN 0021-5198

THE JAPANESE JOURNAL OF PHARMACOLOGY

Volume 74 1997

Official Publication
of
The Japanese Pharmacological
Society

THE JAPANESE JOURNAL OF

PHARMACOLOGY

Published Monthly by The Japanese Pharmacological Society

Volume 74 1997

http://wwwsoc.nacsis.ac.jp/tjps/jjp

Vol. 74 No. 1 No. 2 No. 3

Chief Editor
Masashi Sasa (Hiroshima)

Press Editor
Akinori Akaike (Kyoto)

Editors
Akemichi Baba (Suita)
Michihiro Fujiwara (Fukuoka)
Hiroshi Iwao (Osaka)
Miwa Misawa (Tokyo)
Yasuyuki Nomura (Sapporo)
Susumu Okabe (Kyoto)
Tomio Okamura (Ohtsu)
Hajime Yasuhara (Tokyo)

Editorial Advisory Board
Toshihiro Dohi (Hiroshima)
Hitoshi Endou (Mitaka)
Kaoru Fuji (Uji)
Chikuma Hamada (Tokyo)
Hajime Ishida (Tokushima)
Takeo Itoh (Nagoya)
Hideo Kanaide (Fukuoka)
Shuji Kaneko (Kyoto)
Takeshi Katsuragi (Fukuoka)
Yasushi Kuraishi (Toyama)
Masaru Minami (Hokkaido)
Masayoshi Mishina (Tokyo)
Hiroshi Mori (Gifu)
Toshitaka Nabeshima (Nagoya)
Haruaki Nakaya (Chiba)
Shuh Narumiya (Kyoto)
Matomo Nishio (Ishikawa)
Sachiko Oh-ishi (Tokyo)
Eiichiro Okabe (Yokosuka)
Kazuo Takahama (Kumamoto)
Toshio Tanaka (Tsu)
Hiroshi Ueda (Nagasaki)
Tetsuro Urushidani (Tokyo)
Yukiharu Yamaguchi (Tokyo)
Hiroyuki Yamamoto (Wakayama)
Kenji Yamamoto (Fukuoka)

Vol. 74 No. 4

Chief Editor
Masashi Sasa (Hiroshima)

Press Editor
Akinori Akaike (Kyoto)

Editors
Akemichi Baba (Suita)
Michihiro Fujiwara (Fukuoka)
Hiroshi Iwao (Osaka)
Miwa Misawa (Tokyo)
Yasuyuki Nomura (Sapporo)
Susumu Okabe (Kyoto)
Tomio Okamura (Ohtsu)
Hajime Yasuhara (Tokyo)

European Editor
Ezio Giacobini (Geneva, Switzerland)

North American Editor
Tony J.F. Lee (Springfield, IL, USA)

Editorial Advisory Board
T. Dohi (Hiroshima)
H. Endou (Mitaka)
K. Fuji (Uji)
C. Hamada (Tokyo)
H. Ishida (Tokushima)
T. Itoh (Nagoya)
H. Kanaide (Fukuoka)
S. Kaneko (Kyoto)
T. Katsuragi (Fukuoka)
Y. Kuraishi (Toyama)
M. Minami (Hokkaido)
M. Mishina (Tokyo)
H. Mori (Gifu)
T. Nabeshima (Nagoya)
H. Nakaya (Chiba)
S. Narumiya (Kyoto)
M. Nishio (Ishikawa)
S. Oh-ishi (Tokyo)
E. Okabe (Yokosuka)
K. Takahama (Kumamoto)
T. Tanaka (Tsu)
H. Ueda (Nagasaki)
T. Urushidani (Tokyo)
Y. Yamaguchi (Tokyo)
H. Yamamoto (Wakayama)
K. Yamamoto (Fukuoka)

International Advisory Board
J.E. Brayden (Burlington, VT, USA)
A. Fisher (Ness Ziona, Israel)
E. Hamel (Montreal, Canada)
M.D. Linnik (Cincinnati, OH, USA)
K. Löffelholz (Mainz, Germany)
G. Pepeu (Florence, Italy)
L.F. Tseng (Milwaukee, WI, USA)

Language Editor S.M. Jung **Editorial Assistant** Y. Takezaki

Abstracted/Indexed in

Biological Abstracts (BIOSIS), Chemical Abstracts, Excerpta Medica (EMBASE), Index Medicus (MEDLINE), Current Contents/Life Sci. (CC/LS), Reference Update (RIS), Current Awareness in Biological Sciences (CABS) and ISI/BIOMED

Editorial and Publishing Correspondence

Editorial Office, The Japanese Pharmacological Society, Kantohya bldg, Gokomachi-Ebisugawa, Nakagyo-ku, Kyoto 604, Japan
TEL +81-75-252-4641/FAX +81-75-252-4618, E-mail: LDB00573@niftyserve.or.jp Information for contributors is printed at the end of each issue.

Subscription Information

Volumes 73–75 (12 issues plus Supplement) will appear in 1997. Subscription orders can be entered only by calendar year.
Subscription/Back issue orders and inquiries should be sent to:
All orders inside Japan and individual orders outside Japan: the Editorial Office at the address given above.
Annual subscription rate is ¥20,000 including postage.
Institutional orders outside Japan: Maruzen Co., Ltd., Export Department, P.O. Box 5050, Tokyo International 100-31, Japan
TEL +81-3-3273-3234/FAX +81-3-3271-6076. Annual subscription rate is US$325.00 including SAL mail postage.
Microfilm/Microfiche editions are available from University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106, USA

Permission to reproduce, in whole or in part, any material published in this Journal must be obtained in written form from both the author of the article and the Publisher, the Editorial Office of The Japanese Pharmacological Society at the address given above.

Notice about photocopying: In order to photocopy any work from this publication, you or your organization must obtain permission from either of the following organizations that have been delegated for copyright clearance by the copyright owner of this publication:
In all countries except for the USA: The Copyright Council of the Academic Societies, 41-6 Akasaka 9-chome, Minato-ku, Tokyo 107, Japan
TEL/FAX +81-3-3475-5618
In the USA: Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA TEL 508-750-8400/FAX 508-750-4744

Copyright © The Japanese Pharmacological Society 1997

CONTENTS

Volume 74 • 1997

Reviews

Number 1 May 1997

Na^+-Ca^{2+} Exchanger: Physiology and Pharmacology	Toshio Matsuda, Kazuhiro Takuma and Akemichi Baba	1

Number 2 June 1997

Structure and Function of Inositol 1,4,5-Trisphosphate Receptor	Yutaka Yoshida and Shoichi Imai	125

Number 3 July 1997

From Molecular Structure to Alzheimer Therapy	Ezio Giacobini	225

Regular Papers

Number 1 May 1997

Amiodarone Induces Two Different Types of Disorders in Mouse Alveolar Macrophages	Yoshihiro Futamura	21
A comparison of the Uricosuric Effects in Rats of Diltiazem and Derivatives of Dihydropyridine (Nicardipine and Nifedipine)	Haruko Sugino and Hideyo Shimada	29
Affinty for [^{3}H]Iloprost Binding Sites and cAMP Synthesis Activity of a 3-Oxa-methano Prostaglandin I_1 Analog, SM-10906, in Human Platelets and Endothelial Cells	Takashi Hiroi, Keiko Maruyama, Kaoru Hattori, Toshio Ohnuki, Takafumi Nagatomo, Kenichi Watanabe, Takaaki Yamamoto and Youichi Hara	37
Central Regulation of Urine Production by a Selective μ-Opioid Agonist, [D-Ala^2, *N*-Me-Phe^4, Gly^5-ol]-Enkephalin, in Rats	Hiromi Tsushima, Mayumi Mori and Tomohiro Matsuda	45
Inhibitory Effects of Talipexole and Pramipexole on MPTP-Induced Dopamine Reduction in the Striatum of C57BL/6N Mice	Yoshihisa Kitamura, Yasuko Kohno, Minako Nakazawa and Yasuyuki Nomura	51
Low-Molecular-Weight Heparin (Dalteparin) Demonstrated a Weaker Effect on Rat Bone Metabolism Compared with Heparin	Masahiko Nishiyama, Fumiaki Itoh and Arao Ujiie	59
Interaction of Orally Administered 5-{3-[((2*S*)-1,4-Benzodioxan-2-ylmethyl)amino]propoxy}-1,3-benzodioxole (MKC-242) with 5-HT_{1A} Receptors in Rat Brain	Shoichi Asano, Toshio Matsuda, Takashi Yoshikawa, Pranee Somboonthum, Hatsue Tasaki, Michikazu Abe and Akemichi Baba	69
Intracisternal Injection of Opioids Induces Itch-Associated Response through μ-Opioid Receptors in Mice	Chihiro Tohda, Tomomi Yamaguchi and Yasushi Kuraishi	77
Interaction of Nitric Oxide and Renin Angiotensin System in Renal Hypertensive Rats	Byung Ho Lee and Hwa Sup Shin	83

Number 2 June 1997

Nicotinic Agonist Modulation of Neurotransmitter Levels in the Rat Frontoparietal Cortex	Kathleen L. Summers, William R. Kem and Ezio Giacobini	139

Beneficial Effects of Dilazep on the Palmitoyl-L-carnitine-Induced Derangements in Isolated, Perfused Rat Heart: Comparison with Tetrodotoxin	Akiyoshi Hara, Johji Arakawa, Hiroko Hashizume and Yasushi Abiko	147
Muscarinic Autoinhibition and Modulatory Role of Protein Kinase C in Acetylcholine Release from the Myenteric Plexus of Guinea Pig Ileum	Noriko Saitoh, Ritsuko Fujimoto, Toshiaki Ishii, Hideaki Nishio, Tadayoshi Takeuchi and Fumiaki Hata	155
Furosemide-Sensitive Calcium Rise Induced by $GABA_A$ Receptor Stimulation in Cultures of Embryonic Rat Striatal Neurons	Yuri Ikeda, Nobuyoshi Nishiyama, Hiroshi Saito and Hiroshi Katsuki	165
Chronic Therapy with Nipradilol, a β-Adrenergic Blocker, Attenuated Left Ventricular Remodeling Following Myocardial Infarction in Rats	Hiroyuki Sonoki, Masaki Nakamura and Akira Takeshita	171
Effects of cAMP and cGMP on L-Type Calcium Channel Currents in Rat Mesenteric Artery Cells	Kyoji Taguchi, Masaki Ueda and Takao Kubo	179
Effects of a New Non-Steroidal 5α-Reductase Inhibitor, FK143, on the Prostate Gland in Beagle Dogs	Masamichi Inami, Ikuo Kawamura, Yoshinori Naoe, Susumu Tsujimoto, Tamotsu Mizota, Toshitaka Manda and Kyoichi Shimomura	187
Effect of Phorbol Esters on Cytosolic Ca^{2+} Level, Myosin Phosphorylation and Muscle Tension in High K^+-Stimulated Bovine Tracheal Smooth Muscle	Masaomi Tajimi, Masatoshi Hori, Hiroshi Ozaki and Hideaki Karaki	195
Modulation of Tyrosine Kinase Activity Has Multiple Actions on Insulin Release from the Pancreatic β-Cell: Studies with Lavendustin A	Mitsuro Hisatomi, Tetsuo Hayakawa, Hiroyoshi Hidaka and Ichiro Niki	203

Number 3 July 1997

Effects of Steroid 5α-Reductase Inhibitor ONO-9302 and Anti-Androgen Allylestrenol on the Prostatic Growth, and Plasma and Prostatic Hormone Levels in Rats	Naohiro Yasuda, Katsuhiro Fujino, Takamitsu Shiraji, Fumio Nambu and Kigen Kondo	243
Neuroprotective Effect of YM90K, an AMPA-Receptor Antagonist, against Delayed Neuronal Death Induced by Transient Global Cerebral Ischemia in Gerbils and Rats	Sachiko Kawasaki-Yatsugi, Shin-ichi Yatsugi, Kazuo Koshiya and Masao Shimizu-Sasamata	253
Effect of Long-Term Administration of Berberine on Scopolamine-Induced Amnesia in Rats	Weng-Huang Peng, Ming-Tsuen Hsieh and Chi-Rei Wu	261
Species Differences in the 5-Hydroxytryptamine-Induced Contraction in the Isolated Distal Ileum	Mayumi Yamano, Hiroyuki Ito and Keiji Miyata	267
Flow-Dependent Regulation of Nitric Oxide Formation in the Isolated Canine Mesenteric Arterial Bed	Tsutomu Nakahara, Kunio Ishii, Yoshio Tanaka and Koichi Nakayama	275

Number 4 August 1997

Role of Cellular Na^+ Accumulation in Acetylcholine-Induced Desensitization of Guinea Pig Ileal Longitudinal Muscle	Shuhei Horio and Hideki Moritoki	291
Effect of an Insulin Sensitizer, Pioglitazone, on Hypertension in Fructose-Drinking Rats	Masami Suzuki, Chisako Nomura, Hiroyuki Odaka and Hitoshi Ikeda	297
Platelet-Derived Growth Factor Blocks the Cell-Cycle Transition from the G_0 to G_1 Phase in Subcultured Angiogenic Endothelial Cells in Rat Thoracic Aorta	Ikuko Kimura, Hiroshi Tsuneki, Motonori Okabe and Masaru Ogasawara	303
Immunopharmacological Studies on Collagen-Induced Arthritis in Dark Agouti (DA) Rats	Hiroyuki Kamada, Moritaka Goto, Satoko Matsuura, Yuko Takaoka and Hiroichi Nagai	313
Inhibitory Mechanism of Mizoribine on the Antibody Production of Mouse B Cells Stimulated with Lipopolysaccharide	Hiroyuki Kamada, Hiromichi Itoh, Hiroshi Shibata, Takehiro Koshio, Akira Hayashi and Keiji Nakagami	323

Short Communications

Number 1 May 1997

Effect of KW-5092, Novel Gastroprokinetic Agent, on the Peristalsis in the Isolated Guinea Pig Ileum	Mayumi Suzuki, Nobuyuki Kishibayashi, Toshihide Yokoyama and Akira Karasawa	91
α-Adrenoceptor Subtype in the Hypothalamic Paraventricular Nucleus Involved in the Regulation of Urine Production: Comparison between Wistar Kyoto and Spontaneously Hypertensive Rats	Hiromi Tsushima and Seigo Fujimoto	95
Effect of Lecithinized-Superoxide Dismutase on the Rat Colitis Model Induced by Dextran Sulfate Sodium	Yusuke Hori, Jiro Hoshino, Chihiro Yamazaki, Tomoko Sekiguchi, Satoshi Miyauchi, Syoji Mizuno and Katsuyuki Horie	99
Possible Mechanisms Underlying the Suppression of Gastric Vagal Afferents Due to Ecabapide (DQ-2511), a Gastroprokinetic Agent, in Rats	Satoshi Hatanaka, Akira Niijima and Kazuhisa Furuhama	105
FR149175, a β_3-Adrenoceptor-Selective Agonist, Is a Possible Therapeutic Agent for Non-Insulin-Dependent Diabetes Mellitus	Hiroko Yamamoto, Shoji Takakura, Tadashi Yamamoto, Hisashi Satoh, Masahide Higaki, Masaaki Tomoi and Kyoichi Shimomura	109
Acetylcholine-Induced Relaxation of Rat Aorta Is Greatest during Estrus in Sexual Cycle	Hideo Honda, Hisayuki Ishihara, Mai Takei and Hiroshi Kogo	113
Suppression of Ischemic Edema in Mice by Manganese-Hyaluronate Conjugate	Katsukiyo Sakurai, Mariko Andoh, Motoyuki Yamada, Yoh Kodera, Hiroyuki Nishimura, Misao Hiroto, Ayako Matsushima, Masaaki Aoyama, Hisao Yamamoto and Yuji Inada	117

Number 2 June 1997

The Selective 5-Hydroxytryptamine (5-HT)$_4$-Receptor Agonist RS67506 Enhances Lower Intestinal Propulsion in Mice	Yukinori Nagakura, Hiroyuki Ito, Tetsuo Kiso, Yuki Naitoh and Keiji Miyata	209
Quenching of Nitric Oxide by an Oral Carbonaceous Adsorbent	Noriko Iwamoto, Katsumi Ito, Junji Kakuchi and Toshimasa Yoshioka	213
Enhancement by Morphine of Radiographic Contrast Media-Induced Histamine Release in Rat Peritoneal Mast Cells	Masanori Sueyasu, Chiharu Komasu, Tomoko Hara, Koujiro Futagami, Yasufumi Kataoka and Ryozo Oishi	217
The Novel Anti-Rheumatic Drug TA-383 Has a Macrophage Migration Enhancing Activity	Makoto Ueno, Takahisa Sugita, Takanori Murakami and Isao Takata	221

Number 3 July 1997

Cimetidine Inhibits the Induction of Long-Term Potentiation in the Dentate Gyrus of Rats In Vivo	Ming Chang, Hiroshi Saito and Kazuho Abe	281
GTS-21, a Nicotinic Agonist, Protects against Neocortical Neuronal Cell Loss Induced by the Nucleus Basalis Magnocellularis Lesion in Rats	Masato Nanri, Nobuo Kasahara, Jyunji Yamamoto, Hidekazu Miyake and Hiroshi Watanabe	285

Number 4 August 1997

Antiepileptic Effects of 20-Hydroxyecdysone on Convulsive Seizures in Spontaneously Epileptic Rats	Ryosuke Hanaya, Masashi Sasa, Kumatoshi Ishihara, Tomohide Akimitsu, Koji Iida, Taku Amano, Tadao Serikawa, Kazunori Arita and Kaoru Kurisu	331
Centrally Applied Nitric Oxide Donors Inhibit Vagally Evoked Rat Gastric Acid Secretion: Involvement of Sympathetic Outflow	Kunihiko Yokotani, Yoshinori Murakami, Yasunobu Okuma and Yoshitsugu Osumi	337

Rapid Communication

Number 1 May 1997

Analysis of Dissociated Single Neurons by Simple and Semi-Quantitative RT-PCR (Reverse Transcription and Polymerase Chain Reaction) Tsugunobu Andoh, Chihiro Tohda and Yasushi Kuraishi 121

Erratum

Number 4 August 1997 341